

REMARKS

This is in response to the Office Action mailed August 28, 2002. In the Office Action, claims 60, 62, and 67-73 were rejected under 35 USC 102(b); claims 60-66, 70-71, and 74-99 were rejected under 35 USC 103(a); and claims 85 and 92 were also objected to. Reexamination and reconsideration of this case is respectfully requested in view of the foregoing amendments and the following remarks.

In this response, claims 60, 70-71, 74, 76-77, 82-85, 92, 94, and 96 have been amended. New claims 100-112 have been added. Claims 1-59 were previously cancelled without prejudice. Accordingly, claims 60-112 remain at issue in the patent application. Of those remaining at issue, claims 60, 83, 94, and 105 are independent claims.

Applicant believes that no new matter has been added by this response.

I) INFORMATION DISCLOSURE STATEMENT

Applicant respectfully thanks the Examiner for considering the information disclosure statement filed early on 12/20/2000 and the three information disclosure statements filed electronically on 06/27/2002.

Applicant apologizes for the large number of references cited. However, please note that what is considered to be material to patentability of claims can be subjective.

Additionally, the information disclosure statement filed on 12/20/2000 was filed early coincident with the filing of this application and cited references which were disclosed in the parent patent application.

The three information disclosure statements, filed electronically on 06/27/2002, made an attempt to categorize the newly cited references, as stated in the remarks of each. These information disclosure statements and the newly cited references therein were not filed late in the prosecution of the application, but before any office action was issued.

II) CLAIM OBJECTIONS

Claims 85 and 92 were objected to in section 3 of the Office Action.

Applicant has amended claims 85 and 92 based on the informalities pointed out by the Office Action. Applicant believes the amendments to claims 85 and 92 now make this objection moot and respectfully requests the withdrawal of the objection to claims 85 and 92.

III) CLAIM REJECTIONS - 35 USC § 102

Claims 60, 62 and 67-73 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,337,396 issued to Chen, et al. (Chen) in section 5 of the Office Action. [Office Action, Sect. 5, lines 1-2]. Applicant respectfully traverses this rejection in its entirety.

Applicant has amended claims 60, 70, and 71 to clarify Applicant's claimed invention.

"To anticipate a claim, the reference must teach every element of the claim. 'A claim is anticipated only if each and every element as set forth in the claim is found, either

expressly or inherently described, in a single prior art reference.' *Verdegaal Bros. V. Union Oil co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). 'The identical invention must be shown in as complete detail as is contained in the claim.' *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." [MPEP § 2131, Original 8th Edition, Aug. 2001, Pg. 2100-69].

Regarding independent claim 60 as amended, Applicant respectfully submits that Chen does not disclose every element of the claim. In particular, Chen at least does not disclose "a base coupled to the shielded housing perpendicular to the first printed circuit board" as recited in amended claim 60. [Claim 60, lines 11-12].

Regarding claim 62, the Office Action seems to ignore the limitation of "perpendicular to a horizontal plane" and "parallel to a horizontal plane" when it states that "the terms 'vertical' and 'horizontal' as used in this claim are relative terms." [Office Action, Para. 5, lines 7-8]. Attached hereto as Exhibit A from Webster's II New College Dictionary, are the dictionary definitions of vertical, horizontal, perpendicular,, parallel, and plane to provide the ordinary meanings of these terms. [Webster's II New College Dictionary, ISBN 0-395-70869-9, Copyright 1995, Pages 533, 796, 820, 842, and 1227].

Moreover, regarding dependent claims 62, and 67-73, Applicant believes that independent claim 60 is in condition for allowance such that dependent claims 62, and 67-73 depending therefrom with added limitations are also in condition for allowance.

For the foregoing reasons, Applicant respectfully requests the withdrawal of the 35 USC § 102(b) rejection of claims 60, 62, and 67-73.

IV) CLAIM REJECTIONS - 35 USC § 103

Claims 60-66, 70-71, and 74-99 were rejected under 35 USC 103(a) for be obvious in view of prior art.

"To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." [MPEP § 2142; Original 8th Edition, Aug. 2001, Pg. 2100-121].

A. U.S. Pat. No. 5,337,396 issued to Chen, et al. ("Chen")

Claims 61, 66, 74-80, 82, 94, 96-97 and 99 were rejected under 35 USC § 103(a) as being unpatentable over U.S. Pat. No. 5,337,396 issued to Chen, et al. ("Chen") in paragraph 7 of the Office Action. [Office Action, Para. 7, lines 1-2]. Applicant respectfully traverses this rejection in its entirety.

Regarding claims 61, 66, 74-80, and 82, depending from independent claim 60, Chen does not disclose "a base coupled to

the shielded housing perpendicular to the first printed circuit board" as recited in amended claim 60. [Claim 60, lines 11-12].

Additionally in regards to claim 61, the Office Action admits that Chen only discloses "terminals 16a-16c of the optoelectronic device 16 [] coupled to pads 20 which are all on the same side of the circuit board 20." [Office Action, para. 7, lines 3-4]. However, the Office Action notes that because Chen's circuit board 20 is double side and has electronic components and traces on both sides that "it would have been obvious to a person having ordinary skill in the art to couple one or more of the terminals to the opposite side of the circuit board depending upon both the layout of the terminals for a particular optoelectronic device package and the available circuit space on the board." [Office Action, para. 7, lines 7-10]. Applicant respectfully disagrees.

The Office Action overlooks the significant modifications needed to Chen's housing 10. It is not a proper ground of rejection when the "suggested combination of references would require a substantial reconstruction and redesign of the elements." [MPEP § 2143.01, Original 8th Edition, Aug. 2001, Pg. 2100-124 and *In re Ratti*, 270 F2d. 810, 123 USPQ 349 (C.C.P.A. 1959)]. Chen's housing 10 is fabricated so that when the leads 16a-16c are coupled to pads 20 on the same side of the circuit board 20, Chen's optoelectronic element 16 is aligned with Chen's receptacle 15. Alignment of Chen's optoelectronic element 16 with Chen's receptacle 15 is very important in order to efficiently couple photons into and out of a fiber optic cable. Simply coupling the leads 16a-16c on opposite sides of the printed circuit board 20, would cause Chen's optoelectronic element 16 to be misaligned with Chen's receptacle 15. Without substantial modifications to Chen's housing 10 as well, Chen's optoelectronic element 16 would be misaligned and tend defeat

the overall purpose of Chen's optic-electronic interface connector. "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." [MPEP § 2143.01, Original 8th Edition, Aug. 2001, Pg. 2100-124 and *In re Gordon*, 733 F2d. 900, 221 USPQ 1125 (Fed. Cir. 1984)].

Regarding dependent claim 74 and independent claim 94, the Office Action states that "it would have been obvious to a person of ordinary skill in the art to include a second printed circuit board having a second optoelectronic device in the Chen module since there are many applications in which it is necessary to provide a transmission and a reception function." [Office Action, para. 7, lines 14-17]. Applicant respectfully disagrees.

Applicant respectfully submits that Chen does not disclose "a second optoelectronic device to receive photons out of or couple photons into a second optical fiber; a second printed circuit board parallel to the first printed circuit board, the second printed circuit board coupled to the second optoelectronic device parallel to an optical axis of the second optoelectronic device, the second printed circuit board having a second plurality of pins; and wherein the shielded housing is spaced around the first and second printed circuit boards to reduce electromagnetic interference (EMI)" as recited in amended claim 74. [Claim 74, lines 3-12].

Applicant respectfully submits that Chen does not disclose "providing a first printed circuit board and coupling terminals of a first optoelectronic device to the first printed circuit board such that an optical axis of the first optoelectronic device is parallel with the first printed circuit board; providing a second printed circuit board and coupling terminals

of a second optoelectronic device to the second printed circuit board such that an optical axis of the second optoelectronic device is parallel with the second printed circuit board; and providing a shielded housing spaced around the first printed circuit board and the second printed circuit board such that the first printed circuit board is parallel with the second printed circuit board and the optical axis of the first optoelectronic device is parallel with the optical axis of the second optoelectronic device" as recited in independent claim 94. [Claim 94, lines 3-18].

To modify Chen to include a second printed circuit board and a second optoelectronic device would require a substantial modification thereto. In particular, Chen's housing 10 would need to be modified substantially in order to support two printed circuit boards therein. Additionally, the printed circuit boards would require alignment so that "the first printed circuit board is parallel with the second printed circuit board" as recited in claim 94 and the "second printed circuit board [is] parallel to the first printed circuit board" as recited in claim 74. [Claim 74, lines 5-6; claim 94, lines 14-16]. It is not a proper ground of rejection when the "suggested combination of references would require a substantial reconstruction and redesign of the elements." [MPEP § 2143.01, Original 8th Edition, Aug. 2001, Pg. 2100-124 and *In re Ratti*, 270 F2d. 810, 123 USPQ 349 (C.C.P.A. 1959)]. It is more likely that two separate "optical-electronic interface connectors" of Chen would be used, one for transmission and one for receiving, each having separate housings, printed circuit boards, and optoelectronic devices.

Moreover, Chen discloses that "[w]hat is important is that RFI/EMI shielding be provided for the interface circuitry desired on the PCB." [Chen, Col. 6, 13-15]. Modifying Chen to

include a second printed circuit board and a second optoelectronic device can introduce crosstalk EMI from one to another, thereby defeating an important purpose of Chen's "optical-electronic interface connector". "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." [MPEP § 2143.01, Original 8th Edition, Aug. 2001, Pg. 2100-124 and *In re Gordon*, 733 F2d. 900, 221 USPQ 1125 (Fed. Cir. 1984)].

Regarding claims dependent claims 75 and 79, the Office Action relies on the same reasoning as to why claim 61 was rejected. Applicant respectfully incorporates herein by reference, its remarks with respect to why claim 61 is allowable and respectfully submits that claims 75 and 79 are allowable for the same reasons.

Regarding claims 76 and 77, Applicant has amended claims 76 and 77 to be consistent with the amendment to independent claim 61. As previously discussed, Chen does not disclose "a base coupled to the shielded housing perpendicular to the first printed circuit board" as recited in amended claim 60. [Claim 60, lines 11-12].

Regarding claims 78 and 79, to modify Chen's metal receptacle 15 to receive to receive and hold a pair (first and second) of optical fiber connectors would require a substantial modification thereto. It is not a proper ground of rejection when the "suggested combination of references would require a substantial reconstruction and redesign of the elements." [MPEP § 2143.01, Original 8th Edition, Aug. 2001, Pg. 2100-124 and *In re Ratti*, 270 F2d. 810, 123 USPQ 349 (C.C.P.A. 1959)]. It is more likely that two separate "metal receptacles" of Chen would be used, one for each optical fiber connector.

Regarding claims 80 and 97, the Office Action seems to ignore the limitation of "perpendicular to a horizontal plane" when it states that "the recited orientations are relative." [Office Action, Para. 7, line 26]. Attached hereto as Exhibit A from Webster's II New College Dictionary, are the dictionary definitions of vertical, horizontal, perpendicular, parallel and plane to provide the ordinary meanings of these terms.

Regarding claims 82 and 96, the Office Action states "it would have been obvious to a skilled artisan to provide an internal shield between the two printed circuit boards in the proposed modification since this would augment the shielding provided by the conductive plastic housing, i.e. the housing blocks EMI from external sources while an internal shield would block EMI from sources within the housing." [Office Action, Para. 7, lines 28-31]. Applicant respectfully disagrees.

Chen does not disclose an internal shield. As discussed previously, modifying Chen as suggested by the Office Action to include first and second printed circuit boards and first and second optoelectronic devices is a substantial modification. Modifying Chen even further with an internal shield is an even greater substantial modification.

Chen discloses that "the conductive plastic housing provides shielding of the leads from externally generated RFI/EMI". [Chen, Col. 3, lines 19-21]. Chen does not disclose shielding any internally generated RFI/EMI.

In this case, the Office Action seems to be using a hindsight analysis, reading Applicant's claim limitations into Chen. "When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to: ... (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention". [MPEP §2141, Original 8th Edition, Aug. 2001, Page 2100-114, citing *Hodosh v. Block Drug*

Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986)]. "The requirement "at the time the invention was made" is to avoid impermissible hindsight." "It is difficult but necessary that the decisionmaker forget what he or she has been taught . . . about the claimed invention and cast the mind back to the time the invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." [MPEP §2141.01, Original 8th Edition, Aug. 2001, Page 2100-115, citing W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984)].

Additionally regarding dependent claims 61, 66, 74-80, and 82, Applicant believes that independent claim 60 is in condition for allowance such that claims depending therefrom with additional limitations are also in condition for allowance.

Additionally regarding dependent claims 96-97, and 99, Applicant believes that independent claim 94 is in condition for allowance such that claims depending therefrom with additional limitations are also in condition for allowance.

B. U.S. Pat. No. 5,337,396 issued to Chen, et al. ("Chen")

Claims 60-66, 70-71, 74-77 and 80-99 were rejected under 35 USC § 103(a) as being unpatentable over U.S. Pat. No. 6,024,500 issued to Wolf ("Wolf") in view of U.S. Pat. No. EP 0652696 A1 issued to Benzoni ("Benzoni") in paragraph 8 of the Office Action. [Office Action, Para. 8, lines 1-2]. Applicant respectfully traverses this rejection in its entirety.

Applicant has amended independent claims 60, 83, and 94.

Regarding independent claim 60, Applicant respectfully submits that Wolf does not disclose a "shielded housing spaced around [a] printed circuit board" as recited in amended claim 60. [Claim 60, lines 8-10].

Regarding independent claim 83, Applicant respectfully submits that Wolf does not disclose a "the shielded housing spaced apart and wrapped around the first printed circuit board and the second printed circuit board to reduce electromagnetic interference (EMI)" as recited in amended claim 83. [Claim 83, lines 22-24].

Regarding independent claim 94, Applicant respectfully submits that Wolf does not disclose a "providing a shielded housing spaced around the first printed circuit board and the second printed circuit board" as recited in amended claim 94. [Claim 94, lines 13-14].

In contrast as illustrated in Wolf's Fig. 1, Wolf discloses mounting printed circuit boards to sidewalls. As stated in Wolf's detailed description, "[a] first hybrid integrated circuit, 20, comprising a first circuit board, 21, and a laser module, (22 of FIG. 2) is mounted on the first sidewall, 12, and a second hybrid integrated circuit, 30, comprising a second circuit board, 31, and a photodetector module (32 of FIG. 3) is mounted on the second sidewall, 13". [Wolf, Col. 1, lines 59-65].

Furthermore, the Office Action admits that Wolf does not disclose a shielded housing when it states that Wolf's "housing is not specifically designed to provide EMI shielding." [Office Action, para. 8, lines 9-10]. Wolf discloses a "dielectric housing, 11, typically comprises a thermoplastic material". [Wolf, Col. 2, lines 3-4]. The Office Action relies on Benzoni to allege that Wolf's "housing may be coated with a conductive

material in order to provide EMI shielding." [OA, Para. 8, lines 12-13].

The Office Action states that "it would have been obvious to one of ordinary skill in the art to modify the Wolf module by simply providing an appropriate conductive coating in the manner taught by Benzoni to provide shielding from external EMI sources." [Office Action, para. 8, lines 15-17]. Applicant respectfully disagrees.

Wolf teaches away from coating its housing with a conductive material. As discussed previously, Wolf discloses a "dielectric housing, 11, typically comprises a thermoplastic material". [Wolf, Col. 2, lines 3-4]. Wolf's housing 11 is dielectric so that Wolf's first circuit board 21 and second circuit board 31 can mount respectively to the first sidewall 12 and the second sidewall 13 of the housing without shorting thereto as illustrated in Wolf's Figure 1. As discussed previously, Wolf discloses "[a] first hybrid integrated circuit, 20, comprising a first circuit board, 21, and a laser module, (22 of FIG. 2) is mounted on the first sidewall, 12, and a second hybrid integrated circuit, 30, comprising a second circuit board, 31, and a photodetector module (32 of FIG. 3) is mounted on the second sidewall, 13". [Wolf, Col. 1, lines 59-65]. Thus to avoid shorting the printed circuit boards to a shielded housing, Wolf teaches away from using a conductive housing by disclosing a dielectric housing and mounting the circuit boards thereto.

Moreover, Wolf suggest that a new process is not needed to meet shielding requirements. Wolf states that Wolf's "package conforms to requirements for the next generation transceiver package without requiring new components or new processes." [Wolf, Col. 3, lines 15-17]. Additionally by mounting the printed circuit boards to the sidewalls, Wolf's "separation of

the electronics, 24 and 34, for the laser and detector onto two boards, 21 and 31, reduces crosstalk between the electronics which is more critical of data rates greater than 1 Gigabit per second." [Wolf, Col. 3, lines 17-20].

Regarding claims 61, 75, 93, and 99, the Office Action states that Wolf's "figs. 2 and 3 appear to depict terminals along both sides of each optoelectronic device 22 and 32, with some terminals of each device being coupled to the upper side of their respective circuit boards 21 and 31 and other terminals being coupled to the opposite (lower) side of the boards." [Office Action, para. 8, lines 20-23]. Applicant respectfully disagrees.

Wolf's figs. 2 and 3 appear to disclose terminals being mounted on the same side of the printed circuit board. Applicant does not recite an upper side and a lower side in claims 61, 75, 93, and 99 as alleged in the Office Action.

Regarding claims 82, 84-85, and 96, Wolf teaches away from using an internal shield to prevent cross talk. As discussed previously, Wolf's mounting of the printed circuit boards to the sidewalls provides "separation of the electronics, 24 and 34, for the laser and detector onto two boards, 21 and 31, reduces crosstalk between the electronics which is more critical of data rates greater than 1 Gigabit per second." [Wolf, Col. 3, lines 17-20]. Furthermore, Benzoni's lid shield requires channels 48 and 50 in housing 20 to support it in position. Modifying Wolf's housing 10 to provide such supports is a substantial modification thereto that can interfere with the function of the optical connector receptacle 23. It is not a proper ground of rejection when the "suggested combination of references would require a substantial reconstruction and redesign of the elements." [MPEP § 2143.01, Original 8th Edition, Aug. 2001, Pg.

2100-124 and *In re Ratti*, 270 F2d. 810, 123 USPQ 349 (C.C.P.A. 1959)].

Regarding claim 90, the Office Action states "it would have been obvious to a skilled artisan to provide the nose with shielding since the nose constitutes an additional entry point for external EMI." [Office Action, Para. 8, lines 45-47]. Applicant respectfully disagrees.

As discussed previously, Wolf does not disclose a shielded housing but a "dielectric housing, 11, typically comprises a thermoplastic material". [Wolf, Col. 2, lines 3-4]. Wolf's optical connector receptacles 23 and 33 are integrally molded with Wolf's housing 11. Wolf states that "[a] standard type of optical connector receptacle, 23, such as an LC-type receptacle, is molded as an integral part of the housing, 11." [Wolf, Col. 2, lines 15-17]. Wolf states that "[a] standard type of optical connector receptacle, 33, such as an LC-type receptacle, is molded as an integral part of the housing, 11." [Wolf, Col. 2, lines 48-50]. Thus, Wolf's optical connector receptacles 23 and 33, being integrally molded with Wolf's housing 11, are also formed of a dielectric material, such as a thermoplastic, and therefore have no shielding properties.

Moreover, Benzoni does not suggest that its receptacle 58, illustrated in Benzoni's Figure 2, needs to be plated to provide shielding. Therefore, neither Wolf nor Benzoni, alone or in combination, teach providing a nose with shielding.

Additionally regarding dependent claims 61-66, 70-71, and 74-82, Applicant believes that independent claim 60 is in condition for allowance such that claims depending therefrom with additional limitations are also in condition for allowance.

Additionally regarding dependent claims 84-93, Applicant believes that independent claim 83 is in condition for allowance such that claims depending therefrom with additional limitations are also in condition for allowance.

Additionally regarding dependent claims 95-99, Applicant believes that independent claim 94 is in condition for allowance such that claims depending therefrom with additional limitations are also in condition for allowance.

For the foregoing reasons, Applicant respectfully requests the withdrawal of these 35 USC § 103(a) rejections of claims 60-66, 70-71, and 74-99.

V) NEW CLAIMS

Applicant has added new claims 100-112.

New claims 100-102 depend directly or indirectly from independent claim 60. New claims 103-104 depend directly from independent claim 83.

Applicant believes it has placed independent claims 60 and 83 in condition for allowance such that the dependent claims 100-104 depending respectively therefrom with further limitations are also in condition for allowance.

New claims 105-112 are of a first impression with claim 105 being a new independent claim. New independent claim 105, recites "a metallic shielded housing spaced apart around the first printed circuit board, the metallic shielded housing to reduce electromagnetic interference (EMI)." [Claim 105, lines 8-10].

Applicant respectfully submits that Chen does not disclose a metallic shielded housing. Chen discloses "a conductive

plastic housing [] injection molded in three parts using a mixture of conductive fibers and plastic". [Chen, Abstract, lines 6-8].

Applicant respectfully submits that Wolf does not disclose a metallic shielded housing. Wolf discloses a "dielectric housing, 11, typically comprises a thermoplastic material". [Wolf, Col. 2, lines 3-4].

Moreover, Applicant respectfully submits that Wolf does not disclose a "housing spaced apart around [a] printed circuit board" as recited in claim 105. [Claim 105, lines 8-9]. In contrast as illustrated in Wolf's Fig. 1, Wolf discloses mounting printed circuit boards to sidewalls. As stated in Wolf's detailed description, "[a] first hybrid integrated circuit, 20, comprising a first circuit board, 21, and a laser module, (22 of FIG. 2) is mounted on the first sidewall, 12, and a second hybrid integrated circuit, 30, comprising a second circuit board, 31, and a photodetector module (32 of FIG. 3) is mounted on the second sidewall, 13". [Wolf, Col. 1, lines 59-65].

For the foregoing reasons, Applicant respectfully submits that new claims 105-112 are also in condition for allowance.

MARKED UP VERSION OF AMENDED CLAIMS

1 60. (Currently Amended) A fiber optic module comprising:
2 a first optoelectronic device to couple photons into or
3 receive photons out of a first optical fiber;
4 a first printed circuit board coupled to the first
5 optoelectronic device parallel to an optical axis of the first
6 optoelectronic device, the first printed circuit board having
7 one or more pins; ~~and~~
8 a shielded housing spaced around the first printed circuit
9 board, the shielded housing to reduce electromagnetic
10 interference (EMI); and
11 a base coupled to the shielded housing perpendicular to the
12 first printed circuit board.

1 70. (Currently Amended) The fiber optic module of claim 60
2 wherein,
3 the shielded housing includes the ~~has a~~ base as a portion
4 thereof, the base having one or more openings from which the one
5 or more pins of the first printed board extend.

1 71. (Currently Amended) The fiber optic module of claim 60
2 ~~further comprising:~~ wherein,

3 ~~a base coupled to the shielded housing,~~ the base has having
4 one or more openings from which the one or more pins of the
5 first printed board extend.

1 74. (Currently Amended) The fiber optic module of claim 60
2 further comprising:

3 a second optoelectronic device to receive photons out of or
4 couple photons into a second optical fiber;

5 a second printed circuit board parallel to the first
6 printed circuit board, the second printed circuit board coupled
7 to the second optoelectronic device parallel to an optical axis
8 of the second optoelectronic device, the second printed circuit
9 board having a second plurality of pins; and wherein,

10 the shielded housing is spaced around the first and second
11 printed circuit boards to reduce electromagnetic interference
12 (EMI).

1 76. (Currently Amended) The fiber optic module of claim 74
2 wherein,

3 the shielded housing includes the ~~has a~~ base as a portion
4 thereof, the base having openings from which the one or more
5 pins of the first printed board extend and the one or more pins
6 of second printed circuit board extend.

1 77. (Currently Amended) The fiber optic module of claim 74
2 ~~further comprising:~~ wherein,
3 ~~a base coupled to the shielded housing,~~ the base has ~~having~~
4 openings from which the one or more pins of the first printed
5 board extend and the one or more pins of second printed circuit
6 board extend.

1 82. (Currently Amended) The fiber optic module of claim 74
2 further comprising:
3 an internal shield between the first printed circuit board
4 and the second printed circuit board and parallel therewith
5 and wherein, the shielded housing is spaced around the
6 first printed circuit board, ~~the internal shield,~~ and the second
7 printed circuit board to reduce electromagnetic interference
8 (EMI) .

1 83. (Currently Amended) A fiber optic module for coupling
2 photons between optoelectronic devices and optical fibers, the
3 fiber optic module comprising:
4 a base to mount the fiber optic transceiver in a system to
5 couple photons between optoelectronic devices and optical
6 fibers;
7 a first printed circuit board perpendicular to the base,

8 the first printed circuit board having a pin inserted through a
9 first opening in the base;

10 a first optoelectronic device having terminals coupled to
11 the first printed circuit board, the first optoelectronic device
12 having an optical axis parallel to the first printed circuit
13 board;

14 a second printed circuit board perpendicular to the base
15 and parallel to the first printed circuit board, the second
16 printed circuit board having a pin inserted through a second
17 opening in the base;

18 a second optoelectronic device having terminals coupled to
19 the second printed circuit board, the second optoelectronic
20 device having an optical axis parallel to the second printed
21 circuit board; and

22 a shielded housing coupled to the base, the shielded
23 housing spaced apart and wrapped around ~~to encase~~ the first
24 printed circuit board and the second printed circuit board to
25 reduce electromagnetic interference (EMI).

1 84. (Currently Amended) The fiber optic module of claim 83
2 further comprising:

3 an internal shield between the first printed circuit board
4 and the second printed circuit board and parallel therewith

5 and wherein, the shielded housing is spaced apart and

6 wrapped around ~~encases~~ the first printed circuit board, ~~the~~
7 ~~internal shield,~~ and the second printed circuit board to reduce
8 electromagnetic interference (EMI).

1 85. (Currently Amended) The fiber optic module of claim ~~83~~
2 84 wherein,

3 the internal shield provides shielding to reduce crosstalk
4 between the first printed circuit board and the second printed
5 circuit board.

1 92. (Currently Amended) The fiber optic module of claim ~~84~~
2 91, wherein,

3 the emitter is a vertical cavity surface emitting laser
4 (VCSEL).

1 94. (Currently Amended) A method of assembling a fiber
2 optic module, the method comprising:

3 providing a first printed circuit board and coupling
4 terminals of a first optoelectronic device to the first printed
5 circuit board such that an optical axis of the first
6 optoelectronic device is parallel with the first printed circuit
7 board;

8 providing a second printed circuit board and coupling
9 terminals of a second optoelectronic device to the second

10 printed circuit board such that an optical axis of the second
11 optoelectronic device is parallel with the second printed
12 circuit board; and
13 providing a shielded housing spaced around ~~encasing~~ the
14 first printed circuit board and the second printed circuit board
15 ~~by a shielded housing~~ such that the first printed circuit board
16 is parallel with the second printed circuit board and the
17 optical axis of the first optoelectronic device is parallel with
18 the optical axis of the second optoelectronic device.

1 96. (Currently Amended) The method of claim 94 further
2 comprising:

3 prior to providing the shielded housing spaced around
4 ~~encasing~~ the first printed circuit board and the second printed
5 circuit board ~~by the shielded housing~~,
6 inserting an internal shield between the first printed
7 circuit board and the second printed circuit board.

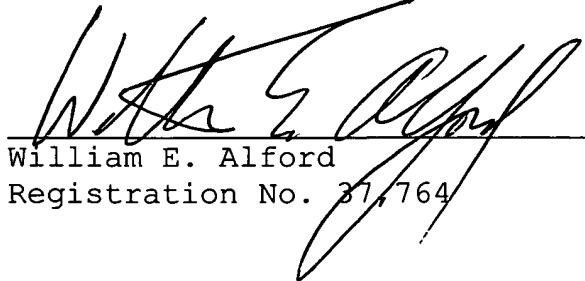
CONCLUSION

In view of the foregoing it is submitted that the claims are in condition for allowance. Reconsideration of the rejection is requested. Allowance of the claims at an early date is solicited.

The Examiner is invited to contact Applicant's undersigned counsel by telephone at (714) 557-3800 to expedite the prosecution of this case should there be any unresolved matters remaining. To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees in connection with the filing of this paper, including extension of time fees, to Deposit Account 02-2666 and please credit any excess fees to such deposit account.

Respectfully submitted
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN, LLP

Dated: February 28, 2003


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EXHIBIT A

Webster's II New College Dictionary Definitions
of
vertical, horizontal, perpendicular, parallel and plane
Pages 533, 796, 820, 842, and 1227

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Webster's II

New College Dictionary



Houghton Mifflin Company

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Cont

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Preface . . .
Elements of
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Pronunciation
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Abbreviations
Biographical
Geographical
Foreign Words
Four-Year Course
Two-Year Course
A Concise
Forms of Address
Table of Measures
Periodic Table
Signs and Symbols

hope-less (hōp'lis) *adj.* 1. Having no hope : DESPAIRING. 2. Offering no hope. 3. Incurable. 4. Having no possibility of solution : IMPOSSIBLE. — **hope'less-ly** *adv.* — **hope'less-ness** *n.*

★ **syns**: HOPELESS, CURELESS, IMPOSSIBLE, INCURABLE, IRREMEDIABLE, IRREPARABLE *adj.* **core meaning** : offering no hope or expectation of improvement <a hopeless financial position> **ant**: HOPEFUL

Hope-well (hōp'wēl', -wəl) *n.* [After the owner of a farm in Ross County, Ohio.] An early Native American culture centered in the Ohio River valley from about the second century B.C. to the fourth century A.D., noted for its large burial mounds.

hop-head (hōp'hēd') *n.* *Slang.* A drug addict.

hop hornbeam *n.* Any of several eastern North American trees of the genus *Ostrya*, esp. *O. virginiana*, yielding fruit resembling hops.

Ho-pi (hō'pē) *n., pl. Hopi* or **-pis**. [Hopi *hopi*, peaceful.] 1. A member of a Pueblo people of northeastern Arizona. 2. The Uto-Aztecan language of the Hopi.

hop-lite (hōp'lit') *n.* [Gk. *hoplitēs* < *hoplon*, weapon.] A heavily armed foot soldier of ancient Greece. — **hop-lit'ic** (-lit'ik) *adj.*

hop-o'-my-thumb (hōp'ə-mī-thūm') *n.* [Alteration of *hop on my thumb*.] A tiny person.

hop-per (hōp'ər) *n.* 1. One that hops. 2. a. A funnel-shaped container in which materials such as grain or fuel are temporarily stored before delivery. b. Any of various other receptacles in which something is stored temporarily. c. A freight car with a door in the floor through which materials are unloaded.

hop-sack-ing (hōp'sāk'ing) *also* **hop-sack** (-sāk') *n.* [From its being used for bags by hop growers.] A loosely woven, coarse cotton or wool fabric used in clothing.

hop-sotch (hōp'skōch') *n.* A children's game in which players toss a small object into the numbered spaces of a pattern of rectangles outlined on the ground and then hop or jump through the spaces to retrieve the object.

ho-ra *also* **ho-rah** (hō'rə, hō'rə) *n.* [Heb. *hōrah* < Rom. *horā*.] A traditional Romanian and Israeli round dance.

ho-ra-ry (hō'rə-rē, hō'r-) *adj.* [Med. Lat. *horarius* < Lat. *hora*, hour.] 1. Of an hour or hours. 2. Occurring once an hour : HOURLY.

Ho-ra-tian (hə-rā'shən) *adj.* Of, pertaining to, or typical of the Latin poet Horace or his works.

horde (hōrd, hōrd) *n.* [Ofr. < G. < Pol. *horda* < Turk. *ordū*, camp.] 1. A large group or crowd : SWARM <hordes of tourists> 2. a. A nomadic Mongol tribe. b. A nomadic tribe or group.

hore-hound (hōr'hound', hōr'-) *n.* [ME < OE *hārehūne* : *hār*, hoary + *hūne*, a kind of plant.] 1. a. An aromatic Eurasian plant, *Marubium vulgare*, bearing leaves covered with whitish pubescence and yielding a bitter extract used as flavoring and a cough remedy. b. A preparation or candy flavored with this extract. 2. Any of various plants similar to the horehound, as the black horehound.

ho-ri-zon (hə-rī'zən) *n.* [ME *orizon* < Ofr. *orizonte* < Llat. *horizon* < Gk. *horizōn* (*kuklos*), limiting (circle) < *horizein*, to limit < *horos*, boundary.] 1. The apparent intersection of the earth and sky as seen by an observer. 2. *Astron.* a. The circular intersection of a plane tangent to the earth at the observer's station with the celestial sphere. b. The intersection with the celestial sphere of a plane through the center of the earth and perpendicular to the line connecting the zenith and the nadir. c. The great circle of the celestial sphere at the intersection of the sensible and rational horizons at infinity, its plane passing through the center of the earth. 3. The range of a person's interest, knowledge, or experience. 4. *Geol.* a. A specific position in a stratigraphic column, as the location of one or more fossils, that identifies the stratum with a particular period. b. A specific layer of soil in a cross section of land.

hor-i-zon-tal (hōr'i-zōn'tl, hōr'-) *adj.* [*< Llat. horizon, horizon.*] 1. a. Of, pertaining to, or close to the horizon. b. Parallel to or in the plane of the horizon. 2. Occupying or restricted to the same level in a hierarchy <a horizontal study of reading ability> — *n.* Something horizontal, as a line, plane, or object. — **hor'i-zon'tal-ly** *adv.*

horizontal union *n.* A craft union.

hor-mone (hōr'mōn') *n.* [Gk. *hormōn*, pr.prt. of *horman*, to urge on < *hormē*, impulse.] A substance produced by one organ and conveyed, as by the bloodstream, to another, which it stimulates to function by means of its chemical activity. — **hor-mon'al** (-mō'nəl), **hor-mon'ic** (-mōn'ik) *adj.* — **hor-mon'al-ly** *adv.*

horn (hōrn) *n.* [ME < OE.] 1. One of the hard, usu. permanent structures projecting from the head of certain mammals, as cattle, sheep, deer, or goats, consisting of a bony core covered with a sheath of keratinous material. 2. A hard protuberance similar to a horn, as an antler or a projection on the head of a giraffe or rhinoceros. 3. a. The hard, smooth keratinous material forming the outer covering of the horns of cattle or related animals. b. A natural or synthetic substance resembling this material. 4. A container made from a horn <a drinking horn> 5. Something shaped like a horn, esp.: a. A cornucopia. b. Either of the ends of a new moon. c. The point of an anvil. d. The pommel of a saddle. e. An ear trumpet. f. A device for projecting sound waves, as in a loudspeaker. g. A hollow, metallic electromagnetic transmission antenna with a rectangular cross section. 6. *Mus.* a. A

wind instrument made of an animal horn. b. A wind instrument made of brass. c. A French horn. d. *Informal.* A trumpet. e. A wind instrument, as a saxophone, used in a jazz band. 7. A usu. electrical signaling device producing a sound similar to that of a horn. 8. *Slang.* A telephone. — *v.* **horned, horn-ing, horns. *Slang.* To join without being invited : INTRUDE <horned in on our tête-à-tête> — *adj.* Made of horn. — **blow (or toot) (one's) own horn.** To brag or boast about oneself.**

horn-beam (hōrn'bēm') *n.* 1. A tree of the genus *Carpinus*, with smooth bark and hard whitish wood. 2. The wood of a hornbeam.

horn-bill (hōrn'bil') *n.* Any of various tropical Old World birds of the family Bucerotidae, with a very large bill, often surmounted by an enlarged protuberance at the base.

horn-blende (hōrn'blēnd') *n.* [G. : *Horn*, horn + *Blende*, blende.] An amphibole mineral, $\text{CaNa}(\text{Mg,Fe})_4(\text{Al,Fe,Ti})_3\text{Si}_6\text{O}_{22}(\text{O,OH})_2$, commonly green or bluish-green to black, formed in the late stages of cooling in igneous rock.

horn-book (hōrn'bōok') *n.* 1. An early primer having a single page protected by a transparent sheet of horn, once used in teaching children to read. 2. A rudimentary text.

horned (hōrnd) *adj.* Having a horn.

horned pout *n.* A hornpout.

horned toad *n.* A short-tailed lizard of the genus *Phrynosoma* of western North America and Central America, with hornlike projections on the head and a flattened spiny body.

horned viper *n.* A venomous African snake, *Cerastes cornutus*, with a hornlike projection above each eye.

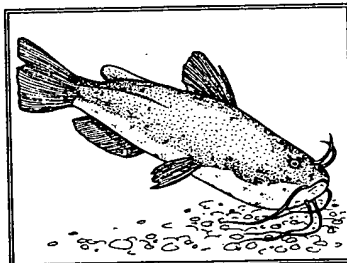
hor-net (hōr'nit) *n.* [ME < OE *hymet*.] Any of various large stinging wasps, chiefly of the genera *Vespa* and *Vespula*, that build a large papery nest.

hor-ni-to (hōr-nē'tō) *n., pl. -tos*. [Sp., dim. of *horno*, oven < Lat. *furnus*.] A low mound of volcanic origin, sometimes emitting vapor or smoke.

horn of plenty *n.* A cornucopia.

horn-pipe (hōrn'pip') *n.* 1. A musical instrument with a single reed, finger holes, and a bell and mouthpiece made of horn. 2. a. A spirited British folk dance orig. accompanied by a hornpipe. b. The music accompanying a hornpipe.

horn-pout (hōrn'pout') *n.* A freshwater catfish native to eastern North America, *Ictalurus nebulosus* or *Ameiurus nebulosus*, with a large head bearing barbels.



hornpout
Approximately
10 inches long

thorn-swog-gle (hōrn'swōg'əl) *vt. -gled, -gling, -gles.* [Orig. unknown.] *Regional.* To bamboozle : deceive.

horn-tail (hōrn'tāl') *n.* Any of various sawflies of the family Siricidae, the female of which has a long, stout ovipositor.

horn-worm (hōrn'wūrm') *n.* The larva of the hawk moth, bearing a hornlike posterior segment.

horn-wort (hōrn'wūrt', -wōrt') *n.* An aquatic plant of the genus *Ceratophyllum*, forming submerged branching masses in slow-moving water.

horn-y (hōr'nē) *adj. -i-er, -i-est.* 1. Having horns or hornlike projections. 2. Made of horn or a similar substance. 3. Tough and caloused, as skin. — **horn'i-ness** *n.*

hor-o-loge (hōr'ə-lōj', hōr'-) *n.* [ME *orloge* < Ofr. < Lat. *horologium* < Gk. *hōrologion* : *hōra*, hour + *legein*, to speak.] A timepiece, esp. an early or primitive one.

Hor-o-lo-gi-um (hōr'ə-lō'jē-əm, hōr'-) *n.* [Lat. *horologium*, *horologe*.] A constellation in the Southern Hemisphere.

ho-rol-o-gy (hō-rōl'ə-jē) *n.* [Gk. *hōra*, hour + *-logos*.] 1. The science of measuring time. 2. The art of making timekeeping instruments. — **hor'o-log'ic** (hōr'ə-lōj'ik, hōr'-), **hor'o-log'i-cal** (-i-kəl) *adj.* — **ho-rol'o-gist, ho-rol'o-ger** *n.*

hor-o-scope (hōr'ə-skōp', hōr'-) *n.* [Ofr. < Lat. *horoscopus* < Gk. *hōroskopos* : *hōra*, hour + *skopos*, observer.] 1. a. The aspect of the planets and stars at a given moment, as the moment of a person's birth, used in astrology. b. A diagram of the signs of the zodiac based on such an aspect. 2. A forecast based on a horoscope.

hor-ren-dous (hō-rēn'dəs, hō-) *adj.* [Lat. *horrendus* < gerundive of *horrēre*, to tremble.] Dreadful : horrible. — **hor-ren'dous-ly** *adv.*

hor-rent (hōr'ənt, hōr'-) *adj.* [Lat. *horrens, horrent*, pr.prt. of *horrēre*, to tremble.] Archaic. Covered with bristles : BRISTLING.

hor-ri-ble (hōr'ə-bəl, hōr'-) *adj.* [ME < Ofr. < Lat. *horribilis* < hor-

a political issue : **BANDWAGON**. 5. An ostentatious display. 6. A public square or promenade. — **v.** **-rad-ed**, **-rad-ing**, **-rades**. — **vt.** 1. To assemble (troops) for a formal display or review. 2. To march or walk through or around. 3. To exhibit ostentatiously : **FLAUNT** <paraded their wealth> — **vi.** 1. To assemble for a formal military review. 2. To take part in a parade. 3. To promenade in a public place. — **pa-rad'-er** *n.*

par-a-di-chlo-ro-ben-zene (pär'ä-dī-klōr'ä-bēn'zēn', -bēn-zēn', -klōr'-) *n.* A white crystalline compound, $C_6H_4Cl_2$, used as a germicide and insecticide.

par-a-digm (pär'ä-dīm', -dīm') *n.* [ME, example < LLat. *paradigma* < Gk. *paradeigma* < *paradeiknūnai*, to exhibit : *para*, alongside + *deiknūnai*, to show.] 1. A list of all the inflectional forms of a word taken as an example of the conjugation or declension to which it belongs. 2. An example. — **par'a-dig-mat'ic** (-dīg-māt'ik) *adj.*

par-a-dise (pär'ä-dis', -diz') *n.* [ME *paradis* < OFr. < LLat. *paradis* < Gk. *paradeisos*, garden < Avestan *pairi-daēza* : *pairi*, around + *daēza*, wall.] 1. **often Paradise.** The Garden of Eden. 2. a. **HEAVEN**. 2. b. An intermediate resting place for righteous souls awaiting the Resurrection. 3. A place of ideal beauty or loveliness <an island *paradise*>. 4. A state of delight. — **par'a-di-si'a-cal** (pär'ä-dī-sī'ä-käl, -zī'ä-käl), **par'a-di-si'a-cal** (-dī-sā'i'ä-käl, -zā'i'ä-käl) *adj.* — **par'a-di-si'a-cal-ly**, **par'a-di-si'a-cal-ly** *adv.*

par-a-dox (pär'ä-dōks') *n., pl. -dōx-es*. [Lat. *paradoxum* < Gk. *paradoxon* < *paradoxos*, conflicting with expectation : *para*, beyond + *doxa*, opinion < *dokein*, to think.] 1. A seemingly contradictory statement that may nonetheless be true. 2. One exhibiting contradictory or inexplicable aspects or qualities. 3. An essentially self-contradictory assertion based on valid deduction from acceptable premises. 4. A statement contrary to popular opinion. — **par'a-dox'i-cal** *adj.* — **par'a-dox'i-cal-ly** *adv.* — **par'a-dox'i-cal-ness** *n.*

par-a-drop (pär'ä-drōp') *n.* The delivery of supplies by parachute. — **vt.** **-dropped**, **-drop-ping**, **-drops**. To deliver by parachute.

par-aes-the-sia (pär'is-thē'zhā) *n.* **var.** of **PARESTHESIA**.

par-a-fin (pär'ä-fīn) *n.* [G. : Lat. *parum*, too little + Lat. *affinis*, associated with (from its lack of affinity with other material).] 1. **Chem.** A white or colorless, waxy, solid hydrocarbon mixture used to make candles, wax paper, lubricants, and sealing materials. 2. **Chem.** A member of the paraffin series. 3. **Chiefly Brit.** Kerosene. — **vt.** **-fined**, **-fin-ing**, **-fins**. To saturate, impregnate; or coat with paraffin. — **par'a-fin'ic** *adj.*

paraffin series *n.* **Chem.** A homologous group of saturated aliphatic hydrocarbons having the general formula C_nH_{2n+2} , the simplest and most abundant of which is methane.

paraffin wax *n.* **PARAFFIN** 1.

par-a-for-mal-de-hyde (pär'ä-för-mäl'dä-hid') *n.* A white solid polymer of formaldehyde, $(HCHO)_n$, where *n* is at least 6, used as a fungicide, disinfectant, and fumigant.

par-a-gen-e-sis (pär'ä-jēn'ī-sis) **also** **par-a-ge-ne-sia** (-jā-nē'zhā, -zhē-ä) *n.* The successive order in which a formation of associated minerals is generated. — **par'a-ge-net'ic** (-jā-nēt'ik) *adj.*

par-a-gon (pär'ä-gōn', -gōn) *n.* [OFr. < Ital. *paragone* < *paragonare*, to test on a touchstone < Gk. *parakonan*, to sharpen : *para*, alongside + *akonē*, whetstone.] 1. A pattern or model of excellence or perfection <a *paragon* of integrity>. 2. a. An unflawed diamond weighing at least 100 carats. b. A very large spherical pearl. 3. A printing type size of 20 points. — **vt.** **-goned**, **-gon-ing**, **-gons**. To parallel or match.

par-a-graph (pär'ä-gräf') *n.* [OFr. *paragraphe* < Med. Lat. *paragraphus*, sign marking a new paragraph < Gk. *paragraphos*, line in a dialogue showing a change of speakers < *paragraphein*, to write beside : *para*, beside + *graphein*, to write.] 1. A distinct division of a written work or composition that expresses a thought or point relevant to the whole but is complete in itself and may consist of one or more sentences. 2. A mark (¶) used to indicate where a new paragraph should begin or to serve as a reference mark. 3. A brief article, notice, or announcement, as in a newspaper. — **vt.** **-graphed**, **-graph-ing**, **-graphs**. To arrange in or divide into paragraphs. — **par'a-graph'ic**, **par'a-graph'ic** *adj.*

Par-a-guay tea (pär'ä-gwī', -gwä') *n.* **MATÉ** 2.

par-a-jour-nal-ism (pär'ä-jūr'näl-iz'm) *n.* Highly subjective journalism. — **par'a-jour'nal-ist** *n.* — **par'a-jour'nal-is'tic** *adj.*

par-a-keet (pär'ä-kēt') *n.* [OFr. *paroquet*.] A small parrot, usu. with a long tapering tail.

par-a-kite (pär'ä-kit') *n.* A specialized parachute that is towed by an automobile or motorboat and lifts a person in its harness up and through the air.

par-al-de-hyde (pä-räl'dä-hid') *n.* [PAR(A)-1 + (ACET)ALDEHYDE.] A colorless aromatic liquid polymer, $C_6H_{12}O_3$, of acetaldehyde, used as a solvent and sedative.

par-a-le-gal (pär'ä-lē'gäl) *adj.* Of, pertaining to, or being a person with specialized training who assists a lawyer. — **par'a-le'gal** *n.*

par-al-lax (pär'ä-läks') *n.* [Fr. *parallaxe* < Gk. *parallaxis* < *parallassein*, to change : *para*, among + *allassein*, to exchange < *allos*, other.] An apparent change in the direction of an object, caused by a change in observational position that provides a new line of sight. — **par'al-lac'tic** (-läk'tik) *adj.*

par-al-lel (pär'ä-lēl') *adj.* [Lat. *parallelus* < Gk. *parallelōs* : *para*, beside + *allēlōn*, of one another < *allos*, other.] 1. Being an equal distance apart at every point. 2. a. Designating two or more straight coplanar lines that do not intersect. b. Designating two or more planes, or a line and a plane, that do not intersect. c. Designating curves or surfaces everywhere equidistant. 3. a. Having readily recognized similarities, analogous aspects, or comparable parts. b. Having the same direction or tendency. 4. Containing or marked by corresponding syntactical constructions or forms. 5. **Mus.** Moving consistently by the same intervals. — Used of two or more melodies. 6. **Elect.** Designating a circuit or part of a circuit connected in parallel. 7. **Computer Sci.** a. Of or relating to the simultaneous transmission of all the bits of a byte over separate wires <a *parallel printer*>. b. Of or relating to the simultaneous performance of multiple operations <*parallel processing*>. — **adv.** In a parallel manner or relationship. — *n.* 1. A line or surface equidistant from another. 2. One of a set of parallel geometric figures, usu. lines. 3. a. Something that is analogous to or closely resembles something else. b. A comparison indicating analogy or similarity. 4. The condition of being parallel : near similarity or exact agreement in particulars. 5. Any of the imaginary lines representing degrees of latitude that encircle the earth parallel to the plane of the equator. 6. A sign (||) indicating material referred to in a note or reference. 7. **Elect.** A configuration of two or more two-terminal components connected between two points in a circuit with one terminal of each connected to each of the two points <circuits in *parallel*>. — **vt.** **-leled**, **-lel-ing**, **-lels**. 1. To make or place parallel to. 2. To be or extend parallel to. 3. To be similar or analogous to. 4. To be or provide an equal or match for. 5. To demonstrate to be analogous.

★ **SYNS:** **PARALLEL**, **COEXTENSIVE**, **COLLATERAL**, **CONCURRENT** *adj.* **core meaning:** lying in the same plane and not intersecting <*parallel railroad tracks*>

parallel bars *pl. n.* 1. Two horizontal poles set parallel to each other in adjustable upright supports and used in gymnastic exercises. 2. A competitive gymnastics event in which parallel bars are used.

par-al-lel-e-pi-ped (pär'ä-lēl'ä-pī'pīd, -pīp'id) *n.* [Gk. *parallelēpipedon* < *parallelōs*, parallel + *epipedon*, plane surface < *epipedos*, level (*epi*, on + *pedon*, ground).] A solid having six faces, each a parallelogram.

par-al-lel-ism (pär'ä-lēl-iz'm) *n.* 1. The state or position of parallel relationship. 2. Likeness, correspondence, or similarity in aspect, course, or tendency. 3. a. The use of corresponding syntactic forms. b. An instance of such use. 4. *Philos.* The doctrine that to every mental change there corresponds a concomitant, but causally unconnected physical alteration.

par-al-lel-o-gram (pär'ä-lēl'ä-grām') *n.* [LLat. *parallelogrammum*, Gk. *parallelōgrammon* < *parallelōgrammos*, bound by parallel lines : *parallelōs*, parallel + *grammē*, line.] A four-sided plane figure with opposite sides parallel.

par-al-o-gism (pä-räl'ä-jīz'm) *n.* [Fr. *paralogisme* < LLat. *paralogismus* < Gk. *paralogismos* < *paralogos*, unreasonable : *para*, beyond + *logos*, reason.] **Logic.** Illogical or fallacious reasoning, esp. a faulty argument of whose fallacy the reasoner is unaware. — **par'al'o-gist** *n.* — **par'al'o-gis'tic** *adj.*

par-a-lyse (pär'ä-līz') *v.* **Chiefly Brit.** **var.** of **PARALYZE**.

par-a-ly-sis (pä-räl'ī-sis) *n., pl. -ses* (-sēz') [Lat. < Gk. *paralysis* < *paraluein*, to disable : *para*, in an injurious way + *luein*, to release.] 1. Partial or complete loss of the ability to move or have sensation in a bodily part as a result of injury to or disease of its nerve supply. 2. Stoppage or impairment of activity <a *paralysis* of industrial production>. — **par'a-lyt'ic** (pär'ä-līt'ik) *adj.* *ē* *n.*

paralysis ag-i-tans (äj'ī-tānz') *n.* [NLat. : Lat. *paralysis*, palsy + Lat. *agitans*, pr.prt. of *agitare*, to shake.] Parkinson's disease.

par-a-lyze (pär'ä-līz') *vt.* **-lyzed**, **-lyz-ing**, **-lyz-es**. [Fr. *paralyser* < *paralyse*, *paralysis* < Lat. *paralysis*.] 1. To affect with paralysis. 2. To make helpless or unable to move. 3. To impair the functioning or progress of <The blizzard *paralyzed* traffic.> — **par'a-ly-za'tion** *n.* — **par'a-lyz'er** *n.*

★ **SYNS:** **PARALYZE**, **BENUMB**, **NUMB**, **STUN**, **STUPEFY** *v.* **core meaning:** to make helpless, as by emotion <Sudden fear *paralyzed* them.>

par-a-mag-net (pär'ä-mäg'nīt) *n.* A paramagnetic substance.

par-a-mag-net-ic (pär'ä-mäg-nēt'ik) *adj.* Pertaining to or denoting a substance in which an induced magnetic field is in the same direction as and greater in strength than the magnetizing field, but much weaker than in ferromagnetic materials. — **par'a-mag-net'ic-ally** *adv.* — **par'a-mag-net-ism** (-mäg'nī-tīz'm) *n.*

par-a-mat-ta or **par-ra-mat-ta** (pär'ä-māt'ä) *n.* [After *Parramatta*, Australia.] A fine light silk-and-wool or cotton-and-wool dress fabric.

par-a-me-ci-um (pär'ä-mē'shē-əm, -sē-əm) *n., pl. -ci-a* (-shē-ä, -sē-ä) or **-ci-ums**. [NLat. *Paramecium*, genus name < Gk. *paramēkes*, oblong : *para*, alongside + *mēkos*, length.] Any of various usu. oval-shaped ciliate protozoans of the genus *Paramecium*, with an oral groove for feeding.

ä pat ä pay ä care ä father ë pet ë be hw which ï pit
i tie ir pier ö pot ö toe ö paw, for oi noise öö took

animal cells and most plant cells that catalyzes peroxide oxidation reactions.

per-ox-ide (pə-rōk'sid') also **per-ox-id** (-sid) *n.* 1. Hydrogen peroxide. 2. A compound containing oxygen that yields hydrogen peroxide with an acid, as sodium peroxide, Na₂O₂. — *vt.* **-id-ed**, **-id-ing**, **-ides**. 1. To treat with peroxide. 2. To bleach (hair) with hydrogen peroxide. — **per-ox-ide'** *adj.*

per-ox-i-some (pə-rōk'si-sōm') *n.* [PEROXI(De) + -SOME³] A cell organelle having enzymes that catalyze the production and breakdown of hydrogen peroxide. — **per-ox-i-som'al** (-sō'məl) *adj.*

per-ox-y (pə-rōk'sē) *adj.* [PER- + OXY-] Containing the bivalent group O₂.

per-pend (pər-pend') *v.* **-pend-ed**, **-pend-ing**, **-pends**. [Lat. *pendere*, to consider carefully: *per-* (intensive) + *pendere*, to consider.] — *vt.* To wonder about: PONDER. — *vi.* To be meditative: REFLECT.

per-pen-dic-u-lar (pər-pən-dik'yo-lər) *adj.* [ME *perpendicular* < OFr. < Lat. *perpendicularis* < *perpendicularum*, plumb line: *per-* (intensive) + *pendere*, to hang.] 1. *Math.* Intersecting at or forming right angles. 2. At right angles to the horizontal: VERTICAL. 3. *often Perpendicular.* Designating a style of English Gothic architecture of the 14th and 15th cent., marked by emphasis of the vertical element. — *n.* 1. A line or plane perpendicular to a line or plane. 2. A vertical position. 3. A device, as a plumb line, used in marking the vertical from a point. 4. A vertical or nearly vertical line or plane. — **per-pen-dic'u-lar'i-ty** (-lār'i-tē) *n.* — **per-pen-dic'u-lar-ly** *adv.*

per-pe-trate (pūr'pī-trāt') *vt.* **-trat-ed**, **-trat-ing**, **-trates**. [Lat. *perpetrare*, *perpetrat*, to accomplish: *per-* (intensive) + *patrare*, to bring about.] To be guilty of: COMMIT <perpetrate a crime> <perpetrate a hoax> — **per-pe-tra'tion** *n.* — **per-pe-tra'tor** *n.*

per-pet-u-al (pər-petch'oo-əl) *adj.* [ME *perpetuel* < OFr. < Lat. *perpetualis* < *perpetuus*, continuous < *perpes*, uninterrupted: *per-* (intensive) + *petere*, to go toward.] 1. Lasting for eternity: never ending. 2. Lasting for an indefinitely long duration. 3. Instituted to be valid for an unlimited duration, as a peace treaty. 4. Continuing without interruption or surcease <perpetual complaining> 5. Flowering throughout the growing season. — **per-pet'u-al-ly** *adv.*

perpetual calendar *n.* A chart or mechanical device that indicates the day of the week corresponding to any given date over a period of many years.

perpetual motion *n.* The hypothetical continuous operation of an isolated mechanical device or other closed system without a sustaining energy source.

per-pet-u-ate (pər-petch'oo-āt') *vt.* **-at-ed**, **-at-ing**, **-ates**. [Lat. *perpetuare*, *perpetuat* < *perpetuus*, continuous. — see PERPETUAL.] 1. To make perpetual. 2. To prolong the existence or remembrance of <perpetuate a childhood fear> — **per-pet'u-ance**, **per-pet'u-a'tion** *n.* — **per-pet'u-a'tor** *n.*

per-pe-tu-i-ty (pūr'pī-tōo'i-tē, -tyōō') *n., pl. -ties*. 1. The quality or state of being perpetual. 2. Time without end: ETERNITY. 3. *Law.* a. The condition of an estate that is limited so as to be inalienable either perpetually or longer than the period determined by law. b. An estate so limited. 4. An annuity payable indefinitely.

per-plex (pər-pleks') *vt.* **-plex-ed**, **-plex-ing**, **-plex-es**. [*<* obs. *perplex*, perplexed < Lat. *perplexus*: *per-* (intensive) + *plectere*, to entwine.] 1. To bewilder or confuse: PUZZLE. 2. To make complex.

per-plex-ed (pər-plekst') *adj.* 1. Bewildered: PUZZLED. 2. Complicated: involved. — **per-plex-ed-ly** (pər-plek'sid-lē) *adv.*

per-plex-i-ty (pər-plek'si-tē) *n., pl. -ties*. 1. The state of being perplexed or puzzled. 2. The condition of being complicated or intricate <"the perplexity of life in twentieth-century America" — Daniel J. Boorstin> 3. Something that perplexes.

per-qui-site (pūr'kwī-zīt) *n.* [ME, property acquired otherwise than by inheritance < Med. Lat. *perquisitum*, acquisition < p.p. of Lat. *perquirere*, to search diligently for: *per-* (intensive) + *quaerere*, to seek.] 1. A profit or payment received in addition to a regular wage or salary, esp. a benefit expected as one's due. 2. A gratuity: tip. 3. Something claimed as an exclusive right <"Politics was the perquisite of the upper class" — Richard B. Sewall>

per-ry (pēr'ē) *n., pl. -ries*. [ME *perrye* < OFr. *pere* < VLat. **piratum* < Lat. *pirum*, pear.] A fermented ciderlike beverage made from pears.

per se (pər sē, sē') *adv.* [Lat.] In or by itself: INTRINSICALLY.

per-se-cute (pūr'si-kyōōt') *vt.* **-cut-ed**, **-cut-ing**, **-cutes**. [OFr. *persecuter* < LLat. *persequi* < Lat., to pursue: *per-* (intensive) + *sequi*, to follow.] 1. To harass or oppress with ill-treatment. 2. To bother persistently: ANNOY. — **per-se-cu'tion** (-kyōō'shən) *n.* — **per-se-cu'tion-al**, **per-se-cu'tive**, **per-se-cu-to'ry** (-kyōō-tōr'ē, -tōr'ē, -kyōō-tā-rē) *adj.* — **per-se-cu'tor** *n.*

Per-se-id (pūr'sē-id) *n., pl. -ids* or **Per-se-i-des** (pər-sē'i-dēz') [*<* Lat. *Perseus*, the constellation Perseus.] A meteor shower that appears to originate near Perseus during the second week of August.

Per-seph-o-ne (pər-séf'ə-nē) *n.* [Lat. < Gk. *Persephōnē*.] *Gk. Myth.* The daughter of Demeter and queen of the underworld as the wife of Hades.

Per-se-us (pūr'sē-əs, -sōōs') *n.* [Lat. < Gk.] 1. *Gk. Myth.* The son of Zeus and Danae who slew Medusa and rescued Andromeda. 2. A constellation in the Northern Hemisphere.

per-se-ver-ance (pūr'sə-vir'əns) *n.* 1. Steadfast adherence to a course of action, belief, or purpose. 2. The Calvinistic doctrine that

those who have been chosen by God will continue in a state of grace to the end and will finally be saved.

per-sev-er-a-tion (pər-sēv'ə-rā'shən) *n.* *Psychol.* Continued or repetitive activity or actions, esp.: a. The uncontrollable repetition of a gesture, word, phrase, or expression. b. The spontaneous recurrence of a thought, image, phrase, or tune in the mind.

per-se-vere (pūr'sə-vir') *vi.* **-vered**, **-ver-ing**, **-veres**. [ME *perseveren* < OFr. *perseverer* < Lat. *perseverare* < *perseverus*, very serious: *per-* (intensive) + *severus*, severe.] To persist in or remain constant to a purpose, idea, or task in the face of discouragement or opposition. — **per-se-ver'ing-ly** *adv.*

Pers-ian (pūr'zhən) *adj.* Of or relating to Persia or Iran, its people, language, or culture. — *n.* 1. A native or resident of ancient Persia or modern Iran. 2. a. Any of the Iranian languages of the Persians in use during various historical periods. b. The modern Iranian language of Iran and western Afghanistan.

Persian cat *n.* A stocky domestic cat with long silky fur.

Persian lamb *n.* 1. The lamb of the karakul sheep of Asia. 2. The glossy, tightly curled fur obtained from the Persian lamb, usu. when it is three or four days old.

Persian melon *n.* A melon, *Cucumis melo inodorus*, with an unridged, light-colored rind and orange flesh.

per-si-flage (pūr'sə-flāzh') *n.* [Fr. < *persifler*, to banter: *per-* (intensive < Lat.) + *siffler*, to whistle (< Lat. *sibilare*)] 1. Light bantering style in writing or speaking. 2. Good-natured raillery.

per-sim-mon (pər-sim'mən) *n.* [Of Algonquian orig.] 1. A chiefly tropical tree of the genus *Diospyros*, with hard wood and orange-red fruit that is edible only when completely ripe. 2. The fruit of a persimmon tree.

per-sist (pər-sist', -zist') *vi.* **-sist-ed**, **-sist-ing**, **-sists**. [Lat. *persistere*: *per-* (intensive) + *sistere*, to stand.] 1. To be obstinately insistent, repetitious, or tenacious. 2. To hold steadfastly and firmly to a purpose, state, or undertaking, despite obstacles, warnings, or setbacks. 3. To continue in existence: LAST. — **per-sis'ter** *n.*

per-sist-ence (pər-sis'təns, -zīs') also **per-sist-en-cy** (-tənsē) *n.* 1. The act of persisting. 2. The quality of being persistent: PERSISTENCE. 3. The continuance of an effect after the cause is removed <persistence of vision>

per-sist-ent (pər-sis'tənt, -zīs') *adj.* 1. Refusing to give up or let go: TENACIOUS. 2. Insistently repetitive or continuous <a persistent dizziness> 3. Enduring. 4. *Bot.* Lasting past maturity without falling off, as certain leaves or flowers. 5. *Zool.* Retained permanently rather than disappearing in an early stage of development <persistent gills> — **per-sist-ent-ly** *adv.*

per-snick-e-ty (pər-snik'i-tē) also **per-nick-e-ty** (-nik'i-tē) *adj.* [Orig. unknown.] *Informal.* 1. Fastidious. 2. Requiring strict attention to detail. — **per-snick'e-ti-ness** *n.*

per-son (pūr'sən) *n.* [ME < OFr. *personne* < Lat. *persona*, prob. < Etruscan *phersu*, mask.] 1. A living human being. Often used in combination <a company spokesperson> 2. The composite of characteristics that make up an individual personality. 3. An individual of specified character <a person of eminence> 4. The living body of a human being <carried camping equipment on his person> 5. Guise: character <"Well, in her person, I say I will not have you" — Shakespeare> 6. Physique and general appearance. 7. *Law.* A human being or organization with legal rights and duties. 8. The separate individualities of the Father, Son, and Holy Spirit, as distinguished from the essence of the Godhead that unites them. 9. a. Any of three groups of pronoun forms with corresponding verb inflections that distinguish between the speaker, the individual addressed, and the individual or thing spoken of. b. Any of the different forms or inflections expressing these distinctions.

per-so-na (pər-sō'nə, -nā') *n.* [Lat. — see PERSON.] 1. *pl. -nae* (-nē). A character in a literary or dramatic work. 2. *pl. -nas.* *Psychol.* The role that a person assumes in order to display his or her conscious intentions.

per-son-a-ble (pūr'sə-nə-bəl) *adj.* Pleasing in appearance or personality: ATTRACTIVE. — **per-son-a-ble-ness** *n.*

per-son-age (pūr'sə-nij) *n.* [ME < OFr. < *personne*, person. — see PERSON.] 1. PERSON. 2. A person of distinction or note.

per-so-na gra-ta (pər-sō'nə grā'ta, grāt'ə) *adj.* [Lat., an acceptable person.] Fully acceptable or welcome, esp. to a foreign government <ambassadors who were persona grata>

per-son-al (pūr'sə-nəl) *adj.* 1. Of or relating to a particular person: PRIVATE <personal concerns> 2. a. Done, made, or performed in person <a personal visit> b. Done to or for or directed toward a particular person <a personal request> 3. Concerning a particular individual's intimate affairs, interests, or activities. 4. a. Aimed pointedly at the most intimate aspects of a person, esp. in a critical or hostile manner <resented the highly personal remark> b. Tending to make remarks, or be unduly questioning, about another's affairs <becomes personal in a dispute> 5. Of or pertaining to the body or physical being <personal hygiene> 6. Pertaining to or having the nature of a person or self-conscious being <a personal Deity> 7. *Law.* Pertaining to a per-

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Plain People *pl. n.* Members of the Mennonite, Amish, or Dunker sects, noted for their custom of wearing plain dress.

plain sailing *n.* Easy progress over a straightforward course.

Plains Indian *n.* A member of any of the American Indian peoples inhabiting the Great Plains of the United States and Canada.

plains-man (plānz'mən) *n.* An inhabitant or settler of U.S. prairie regions.

plain-song (plān'sōng', -sōng') *n.* [Transl. of Med. Lat. *cantus planus*.] 1. Gregorian chant. 2. Any of various bodies of medieval liturgical music without strict meter and sung without accompaniment.

plain-spo-ken (plān'spō'kən) *adj.* Straightforward; candid < a plainspoken commentator > — **plain'spo'ken-ness** *n.*

plaint (plānt) *n.* [ME < OFr. *plainte* < Lat. *placatus*, lament < p. part. of *plangere*, to beat one's breast.] 1. A complaint. 2. An utterance of sorrow or grief: LAMENTATION. 3. Law. A statement of grievance submitted to a court as a request for redress.

plain-tiff (plān'tif) *n.* [ME *playntif* < OFr. *plaintif* < *plaintif*, plaintive.] Law. The party that institutes a suit in a court.

plain-tive (plān'tiv) *adj.* [ME *playntif* < OFr. *plaintif* < *plainte*, plaint.] Expressing sorrow: MOURNFUL. — **plain'tive-ly** *adv.*

plain weave *n.* A weave in which the filling threads and the warp threads interlace alternately, forming a checkerboard pattern.

plait (plāt, plāt) *n.* [ME, fold < OFr. *pleit* < Lat. *plicare*, to fold.] 1. A braid, esp. of hair. 2. A pleat. — **vt.** **plait-ed, plait-ing, plaits.** 1. To braid <plaited the child's long hair> 2. To pleat. 3. To make by braiding or pleating. — **plait'er** *n.*

plan (plān) *n.* [Fr. < *planter*, to plant < Lat. *plantare* < *planta*, sole of the foot.] 1. A detailed scheme, program, or method worked out beforehand for the accomplishment of an object < a career plan> 2. A proposed or tentative project or purpose: INTENTION <made plans for the weekend> 3. An outline or sketch, as of a story. 4. a. A drawing or diagram made to scale showing structure or arrangement <an architectural plan> b. Such a plan showing how to build or assemble something. 5. One of several imaginary planes perpendicular to the line of vision between the viewer and the object being depicted. — **v.** **planned, plan-ning, plans.** — **vt.** 1. To formulate a scheme or program for the accomplishment or attainment of <plan an outreach program> 2. To have as a specific goal or purpose: INTEND <They plan to visit Disneyland> 3. To draw or make a graphic representation of. — **vi.** To make plans. — **plan'ner** *n.*

plan- *pref. var. of PLANO-*

pla-nar (plā'nār, -nār') *adj.* [LLat. *planaris*, flat < Lat. *planus*.] 1. Of, pertaining to, or located in a plane. 2. Flat. 3. Having a two-dimensional characteristic. — **pla-nar'i-ty** (plā'nār'i-tē) *n.*

pla-nar-i-a (plā'nār'ē-ə) *n.* A planarian.

pla-nar-i-an (plā'nār'ē-ən) *n.* [LLat. *Planaria*, genus name < LLat. *planarius*, on level ground < *planus*, flat.] A flatworm of the order Tricladida, with a broad, ciliated body and a three-branched digestive cavity.

pla-na-tion (plā-nā'shən) *n.* [PLANE.] Lateral mechanical erosion, as of a valley, by a running stream.

planch-et (plān'chit) *n.* [Dim. of dial. *planch*, board < ME *plancher* < OFr. *planche* < Lat. *planca*.] 1. A flat disk of metal ready for stamping as a coin. 2. A small disk of metal on which a radioactive substance is deposited for measurement of its activity.

plan-chette (plān-shēt') *n.* [Fr. dim. of OFr. *planche*, board. — see PLANCHET.] A small triangular board with a pointer supported by two casters and a vertical pencil reputed to spell out messages from the spirit world when the operator's fingers are placed lightly upon it.

Planck's constant (plāngks) *n.* [After Max K.E.L. Planck (1858–1947).] Physics. The constant of proportionality relating the quantum of energy that can be possessed by radiation to the frequency of that radiation; its value is approx. 6.625×10^{-27} erg-second.

plane¹ (plān) *n.* [Lat. *planum*, flat surface < *planus*, flat.] 1. Math. A surface containing all the straight lines connecting any two points on it. 2. A level or flat surface. 3. A stage or level of existence, development, or achievement <lectures on a spiritual plane> 4. An airplane or hydroplane. 5. A supporting surface of an airplane, as an airfoil or wing. — **adj.** 1. Math. Designating a figure lying in a plane. 2. Flat. — **plane'ness** *n.*

plane² (plān) *n.* [ME < OFr. < LLat. *plana* < *planare*, to plane < *planus*, flat.] 1. A carpenter's tool with an adjustable blade for leveling and smoothing wood. 2. A trowel-shaped tool for smoothing the surface of clay, sand, or plaster in a mold. — **v.** **planed, plan-ing, planes.** — **vt.** 1. To smooth with or as if with a plane. 2. To remove with a plane. — **vi.** 1. To undergo planing. 2. To act as a plane.

plane³ (plān) *vi. **planed, plan-ing, planes.** [Fr. *planer*, to glide < *plan*, level surface < Lat. *planum* < *planus*, flat.] 1. To rise partly out of the water, as a hydroplane does at high speeds. 2. To soar or glide. 3. To travel by airplane.*

plane⁴ (plān) *n.* [ME < OFr. < Lat. *platanus* < Gk. *platanos* < *platus*, broad.] The plane tree.

plane angle *n.* An angle formed by two straight lines.

plane geometry *n.* The geometry of planar figures.

plane-load (plān'lōd') *n.* The load an airplane can carry.

plan-er (plā'nār) *n.* 1. One that planes. 2. A machine tool for leveling and smoothing the surfaces of wood or metal. 3. A smooth block of wood used to level a form of type.

pla-ner tree (plā'nār) *n.* [After J.J. Planer (1743–1789).] A small swamp tree, *Planera aquatica* of the southern United States, bearing small, rough, nutlike fruit.

plane-side (plān'sid') *n.* The area next to an airplane.

plan-et (plān'it) *n.* [ME < OFr. *planete* < LLat. *planeta* < Gk. *planēs*, wanderer < *planasthai*, to wander.] 1. A nonluminous celestial body illuminated by light from a star, as the sun, around which it revolves. 2. One of the seven celestial bodies visible to the naked eye and thought to revolve in the heavens about a fixed Earth and among fixed stars in ancient astronomy. 3. One of the seven revolving celestial bodies that in conjunction with the stars are supposed to influence human personalities and concerns.

plane table *n.* A portable surveying instrument consisting primarily of a drawing board and a ruler mounted on a tripod and used to sight and map topographical details.

plan-e-tar-i-um (plān'it-ār'ē-əm) *n., pl. -iums or -ia* (ē-ə). 1. An apparatus or model representing the solar system. 2. A device for projecting images of celestial bodies in their courses onto the inner surface of a hemispherical dome. 3. A building or room containing a planetarium.

plan-e-tar-y (plān'it-ār'ē) *adj.* 1. Of, relating to, or like the physical or orbital characteristics of a planet or the planets. 2. a. Worldwide: global. b. Terrestrial: mundane. 3. Erratic: wandering. 4. Denoting or relating to a gear train consisting of a central gear with an internal ring gear and one or more pinions. 5. Of enormous size or scope.

planetary nebula *n.* Any of several objects in the Galaxy having a hot, blue-white, central star surrounded by an envelope of expanding gas.

plan-e-tes-i-mal (plān'it-ēs'ē-məl, -tēs'ē-) *n.* [PLANET + (INFINIT)-ESIMAL.] One of innumerable small bodies held to have orbited the sun during the formation of the planets. — **plan'e-tes'i-mal** *adj.*

planetesimal hypothesis *n.* The hypothesis that the planets and satellites of the solar system were formed by gravitational aggregation of planetesimals.

plan-e-to-id (plān'it-toid') *n.* ASTEROID 1. — **plan'e-toi'dal** *adj.*

plane tree *n.* A tree of the genus *Platanus*, with ball-shaped clusters of fruit and outer bark that usu. flakes off in patches.

planet wheel *n.* One of the small gear wheels in an epicyclic train.

plan-gent (plān'jənt) *adj.* [Lat. *plangens*, 'plangent', p. part. of *plangere*, to strike.] 1. a. Striking with a deep, reverberating sound, as waves against the shore. b. Loud and sonorous, as the sound of bells: RESONANT. 2. Expressing sadness: PLAINTIVE. — **plan'gen-cy** *n.* — **plan'gent-ly** *adv.*

plani- *pref. var. of PLANO-*

plan-im-e-ter (plā-nim'it-ər, plā-) *n.* [Fr. *planimètre*: Lat. *planum*, level surface (< *planus*, flat) + *mètre*, meter < Gk. *metron*, measure.] An instrument that measures the area of a plane figure as a mechanically coupled pointer traverses the figure's perimeter. — **pla'ni-met'ric** (plā'nā-mēt'rik), **pla'ni-met'ri-cal** *adj.* — **pla'ni-met'ri-cal-ly** *adv.* — **pla-nim'e-try** *n.*

plan-ish (plān'ish) *vt.* **-ished, -ish-ing, -ish-es.** [OFr. *planir*, *planiss*, to make smooth < *plan*, level < Lat. *planus*.] To smooth, flatten, toughen, or polish (metal) by hammering or rolling. — **plan'-ish-er** *n.*

pla-ni-sphere (plā'nī-sfir') *n.* [ME *planisperie* < Med. Lat. *planisphaerium*: Lat. *planus*, flat + Lat. *sphaera*, sphere < Gk. *sphaira*.] 1. A representation of a sphere or part of a sphere on a plane surface. 2. Astron. A polar projection of the celestial sphere on a chart equipped with an adjustable overlay to show the stars visible at a given time and place. — **pla'ni-spher'ic** (-sfir'ik, -sfēr'-), **pla'ni-spher'i-cal** *adj.*

plank (plāngk) *n.* [ME < ONFr. *planke* < Lat. *planca*.] 1. a. A piece of lumber cut thicker than a board. b. PLANKING 2. 2. A support: foundation. 3. One of the articles of a political platform. — **vt.** **planked, plank-ing, planks.** 1. To furnish or cover with planks. 2. To bake or broil and serve (fish or meat) on a plank. 3. To put or set down emphatically or with force. 4. Informal. To pay immediately <planked down \$100 for the ticket>

plank-ing (plāng'king) *n.* 1. The act of laying planks. 2. Planks as a whole. 3. Something made of planks.

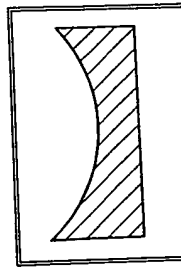
plank-sheer (plāngk'shir') *n.* [Alteration of obs. *plancher*, planking < ME *plancher* < OFr. *planchier* < *planche*, plank < Lat. *planca*.] A horizontal timber forming the outer edge of the upper deck of a wooden ship.

plank-ter (plāngk'tər) *n.* [Gk. *planktēr*, wanderer < *planktos*, wandering. — see PLANKTON.] One of the minute organisms that collectively make up plankton.

plank-ton (plāngk'tən) *n.* [G. < Gk., neuter of *planktos*, wandering < *plazein*, to drive astray.] Generally microscopic plant and animal organisms that float or drift in great numbers in fresh or salt water. — **plank-ton'ic** (-tōn'ik) *adj.*

Planned Parenthood (plānd). A service mark for an organization that provides family planning services.

plano- or **plani-** < noconvex>
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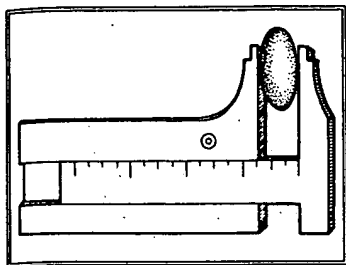


pla-no-con-vex
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pla-nog-ra-phy
a smooth surface,
(plā'nā-grāf'ik) *adj.*
pla-nom-e-ter (plā'nō-mē-tēr)
the accuracy of a
nom'e-try *n.*
plant (plānt) *n.* [A
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Plantae, character
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tion. 2. A plant, as
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tree < Lat. *platanus*
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plan-ta-tion
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+ Lat. *-gradus*,
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planus, flat.]
— **plan'u-lar**
plaque (plāk)
to patch.] 1. A
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vernier caliper *n.* A measuring instrument consisting of an L-shaped frame with a linear scale along its longer arm and an L-shaped sliding attachment with a vernier scale, for reading directly the dimension of an object represented by the separation between the inner or outer edges of the two shorter arms.



vernier caliper

vernier rocket *n.* A small rocket engine used primarily for making fine adjustments in velocity and trajectory.

ver-o-nal (vēr'ō-nāl', -nəl) *n.* [Orig. a trademark.] A barbital.

ve-ron-i-ca (və-rōn'i-kə) *n.* [NLat. *Veronica*, genus name.] Any of various plants of the genus *Veronica*, which includes the speedwells.

ve-ron-i-ca (və-rōn'i-kə) *n.* 1. The representation or image of the face of Jesus, which, in keeping with legend, was impressed on the handkerchief Saint Veronica offered to him on the road to Calvary. 2. A representation of Jesus' face on a fabric resembling the legendary veronica.

ve-ron-i-ca (və-rōn'i-kə) *n.* [Sp.] A maneuver in bullfighting in which the matador stands immobile while passing the cape slowly in front of the charging bull.

ver-ru-ca (və-rōo'kə) *n., pl. -cae* (-kē) [Lat.] 1. *Med.* A wart. 2. *Biol.* A wartlike projection, as on the back of a toad or on some plant leaves.

ver-ru-cose (və-rōo'kōs') also **ver-ru-cous** (-kəs) *adj.* [Lat. *varrucosus* < *verruca*, wart.] Covered with warts or wartlike projections.

ver-sant (vūr'sənt) *n.* [Fr. < OFr. < Lat. *versans*, p.p. of *versare*, to turn frequently. — see *VERSATILE*.] 1. The slope of one side of a mountain or mountain range. 2. The general slope of a region.

ver-sa-tile (vūr'sə-təl, -tīl') *adj.* [Fr. < Lat. *versatilis* < *versare*, freq. of *vertere*, to turn.] 1. Capable of doing many things. 2. Having many uses or serving various functions < "The most versatile of vegetables is the tomato" — Craig Claiborne > 3. Inconstant or variable: *CHANGEABLE* < a versatile temperament > 4. *Biol.* Capable of moving freely in all directions, as the antenna of an insect or the loosely joined anther of a flower. — **ver-sa-tile-ly** *adv.* — **ver-sa-til'i-ty** (-tīl'i-tē), **ver-sa-tile-ness** *n.*

verse (vūrs) *n.* [ME *vers*, a line of poetry < OE *fers* and OFr. *vers*, both < Lat. *versus* < p.p. of *vertere*, to turn.] 1. Writing that follows a metrical pattern: *POETRY*. 2. a. One line of poetry. b. A section or subdivision of a metrical composition, as a stanza. 3. Light, often whimsical poetry. 4. A specific type of metrical composition, as blank verse or free verse. 5. One of the numbered subdivisions of a chapter in the Bible. — *vt.* & *vi.* **versed**, **vers-ing**, **vers-es**. To versify (something) or to write poetry.

verse (vūrs) *vt.* **versed**, **vers-ing**, **vers-es**. [Back-formation < *versed*, experienced < Lat. *versatus*, p.p. of *versari*, to occupy oneself.] To make familiar, knowledgeable, or skilled: *SCHOOL* < verse oneself in economics >

versed cosine (vūrst) *n.* [VERSED (SINE) + COSINE.] A trigonometric function of an angle equal to one minus the sine of that angle.

versed sine *n.* [Transl. of NLat. *sinus versus*.] A trigonometric function of an angle equal to one minus the cosine of that angle.

ver-si-cle (vūr'sī-kəl) *n.* [ME < OFr. *versicule* < Lat. *versiculus*, dim. of *versus*, verse.] 1. A short verse. 2. A short sentence chanted or spoken by a priest and followed by a congregational response.

ver-si-col-or (vūr'sī-kūl'ər) also **ver-si-col-ored** (-kūl'ərd) *adj.* [Lat. : *versus*, p.p. of *vertere*, to turn + *color*, color.] 1. Having a variety of colors: *VARIEGATED*. 2. Changing in color: *IRIDESCENT*.

ver-si-fy (vūr'sī-fi') *v.* **-fied**, **-fy-ing**, **-fies**. [ME *versifien* < OFr. *versifier* < Lat. *versificare* : *versus*, verse + *facere*, to make.] — *vt.* 1. To change from prose into metrical form. 2. To write a poem about. — *vi.* To write verses. — **ver-si-fi-ca'tion** *n.* — **ver-si-fi'er** *n.*

ver-sine (vūr'sīn') *n.* [Contraction of VERSED SINE.] A versed sine.

ver-sion (vūr'zhən, -shən) *n.* [OFr. < Med. Lat. *versio*, act of turning < Lat. *vertere*, to turn.] 1. A description, narration, or account told from a particular point of view < two different versions of the same accident > 2. a. A translation from another language. b. *often* **Version**. A translation of the entire Bible or a section of it. 3. A form or variation of an earlier or original model < an electrified version of the grandfather clock > 4. An adaptation of a work of art or literature into

another medium or style < the stage version of the motion picture > 5. *Med. a.* Manipulation of a fetus in the uterus to bring it into a favorable position for delivery. b. A deflection of an organ, as the uterus, from its usual position. — **ver'sion-al** *adj.*

vers li-bre (vēr lē'brə) *n.* [Fr.] Free verse.

ver-so (vūr'sō) *n., pl. -sos*. [NLat. *verso* (*folio*), (with the page) turned.] 1. The left-hand page of a book or the reverse side of a leaf. 2. The back of a coin or medal.

verst (vūrst) *n.* [Fr. *verste* < R. *versta*.] A Russian measure of linear distance equivalent to about two thirds of a mile.

ver-sus (vūr'ss) *prep.* [Med. Lat. < Lat., toward < p.p. of *vertere*, to turn.] 1. Against < the Triple Alliance versus the Triple Entente > 2. As an alternative to or in contrast with < partial compromise versus total defeat >

vert (vūrt) *n.* [ME *verte* < AN < OFr. *vert*, *verd*, green. — see *VERDANT*.] 1. a. Green vegetation that can serve as cover for deer in English forest law. b. The right to cut such vegetation. 2. The color green, esp. in heraldry.

ver-te-bra (vūr'tə-brə) *n., pl. -brae* (-brē) or **-bras**. [Lat. < *vertere*, to turn.] Any of the bones or cartilaginous segments making up the spinal column.

ver-te-bral (vūr'tə-brəl, vər-tē'brəl) *adj.* 1. Of, pertaining to, or characteristic of a vertebra. 2. Having or consisting of vertebrae. — **ver'te-bral-ly** *adv.*

vertebral canal *n.* The spinal canal.

vertebral column *n.* The spinal column.

ver-te-brate (vūr'tə-brīt, -brāt') *adj.* [Lat. *vertebratus* < *vertebra*, vertebra.] 1. Having a backbone or spinal column. 2. Of or characteristic of a vertebrate or vertebrates. — *n.* A member of the subphylum Vertebrata, a primary division of the phylum Chordata that includes the fishes, amphibians, reptiles, birds, and mammals, all of which have a segmented bony or cartilaginous spinal column.

ver-tex (vūr'tēks') *n., pl. -tex-es* or **-ti-ces** (-tī-sēz') [Lat. < *vertere*, to turn.] 1. The highest point: *APEX*. 2. *Anat. a.* The highest point of the skull. b. The top of the head. 3. *Astron.* The highest point reached in the apparent motion of a celestial body. 4. a. The point at which the sides of an angle intersect. b. The point on a triangle opposite to and farthest away from its base. c. A point on a polyhedron common to three or more sides. d. The fixed point that is one of the three generating characteristics of a conic section.

ver-ti-cal (vūr'tī-kəl) *adj.* [Fr. or LLat. *verticalis*, both < Lat. *vertex*, highest point.] 1. Being at right angles to the horizon: extending perpendicularly from a plane. 2. Relating to or located at the vertex or highest point: directly overhead. 3. *Anat.* Of or relating to the vertex of the head. 4. Relating to, made up of, or controlling all the levels or grades in the manufacture and sale of a product. — *n.* 1. A vertical line, plane, or circle. 2. A vertical position. — **ver'ti-cal-i-ty** (-kāl'i-tē), **ver'ti-cal-ness** *n.* — **ver'ti-cal-ly** *adv.*

* **syns:** VERTICAL, PERPENDICULAR, PLUMB, UPRIGHT *adj.* **core meaning:** being at right angles to the horizon or to level ground < a vertical flagpole > **ant:** HORIZONTAL

vertical circle *n.* A great circle on the celestial sphere that passes through the zenith and the nadir and thus is perpendicular to the horizon.

vertical file *n.* A collection of items, as pamphlets, sheets of paper, and mounted photographs, that have been gathered together and arranged for ready reference, as in a library.

vertical union *n.* A labor union, the members of which are organized according to the industry for which they work instead of by their particular skill or craft.

ver-ti-ces (vūr'tī-sēz') *n.* *var. pl.* of *VERTEX*.

ver-ti-cil (vūr'tī-sīl') *n.* [Lat. *verticillus*, the whorl of a spindle, dim. of *vertex*, highest point.] A circular arrangement, as of flowers or leaves, about a point on an axis: *WHORL*.

ver-ti-cil-las-ter (vūr'tī-sā-lās'tər) *n.* [NLat. < Lat. *verticillus*. — see *VERTICIL*.] An inflorescence similar to a whorl but actually arising in the axils of opposite leaves. — **ver'ti-cil-las'trate'** (-trāt') *adj.*

ver-ti-cil-late (vūr'tī-sīl'īt, -āt') also **ver-ti-cil-lat-ed** (-sīl'-ā'tīd) *adj.* Arranged in or forming a whorl or whorls. — **ver'ti-cil-late-ly** *adv.* — **ver'ti-cil-la'tion** *n.*

ver-tig-i-nous (vər-tīj'ə-nəs) *adj.* [Lat. *vertiginosus* < *vertigo*, a whirling < *vertere*, to turn.] 1. Turning about an axis: *REVOLVING*. 2. Affected by vertigo: *DIZZY*. 3. Likely to cause vertigo < vertiginous altitude > 4. Liable to rapid change: *UNSTABLE*. — **ver-tig'i-nous-ly** *adv.* — **ver-tig'i-nous-ness** *n.*

ver-ti-go (vūr'tī-gō') *n., pl. -goes* or **-gos**. [Lat. < *vertere*, to turn.] 1. The sensation of dizziness and the feeling that oneself or one's surroundings are whirling about. 2. A jumbled, disoriented state of mind.

ver-tu (vər-tōo') *n.* *var.* of *VIRTU*.

ver-vain (vūr'vān') *n.* [ME *verveine* < OFr. < Lat. *verbena*. — see *VERBENA*.] Any of several plants of the genus *Verbena*, with slender spikes of small blue, purplish, or white flowers.

verve (vūrv) *n.* [Fr. < OFr., fanciful expression < Lat. *verba*, pl. of *verbum*, word.] 1. Energy and enthusiasm in the expression of ideas and esp. in artistic performance or composition. 2. Liveliness: vitality. 3. *Archaic.* Talent: aptitude.